TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren

Not yet assigned U.S. Serial No.:

1 of 52 Page:

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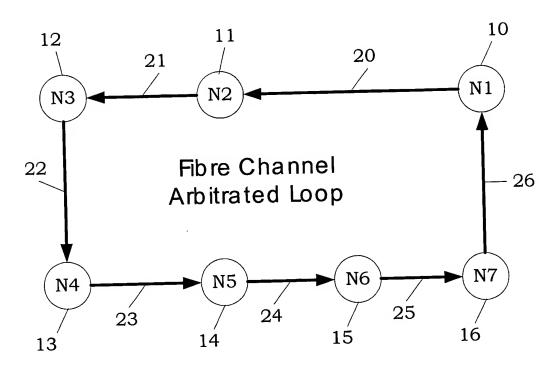


Fig. 1

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL

TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren

U.S. Serial No.: Not yet assigned 2 of 52

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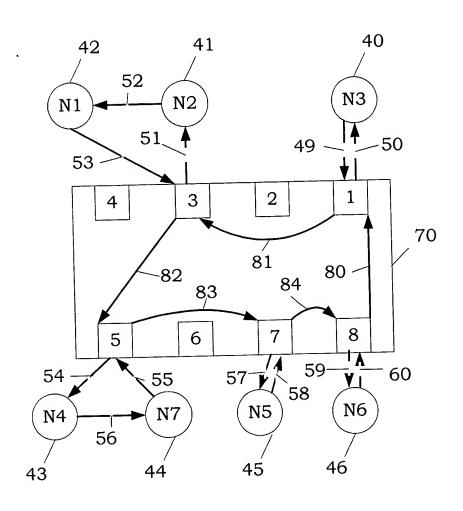


Fig. 2

Warren INVENTOR(S): Not yet assigned U.S. Serial No.: 3 of 52 Page: Exp Mail label EV337191006US 90 92 91 102 Ν3 N2N 1 101 100 111 103 -1 3 2 4 120 112 -113 115 1,14 8 7 5 6 109 110 104 105 107-108 N6 N5 N4 N7

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL

ARBITRATED LOOP SYSTEMS

Fibre Channel Arbitrated Loop Hub

106

93

94

Fig. 3

95

96

TITLE: METHODS AND APPARATUS FOR

Fig. 4

TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS Warren INVENTOR(S):

U.S. Serial No.:

Not yet assigned 5 of 52 Page: Exp Mail label EV337191006US

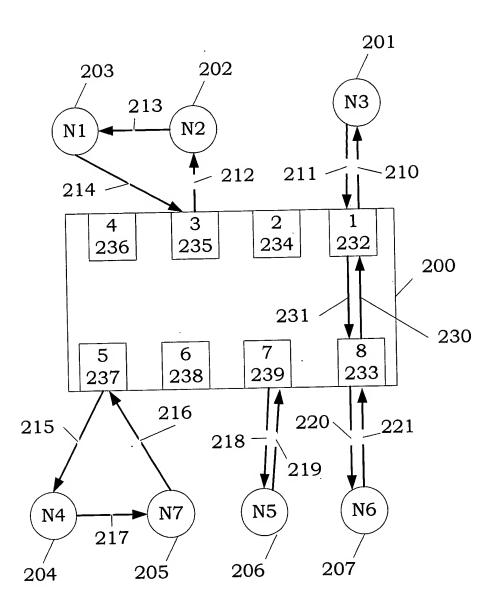


Fig. 5

TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS Warren INVENTOR(S):

U.S. Serial No.: Page:

Not yet assigned 6 of 52 Exp Mail label EV337191006US

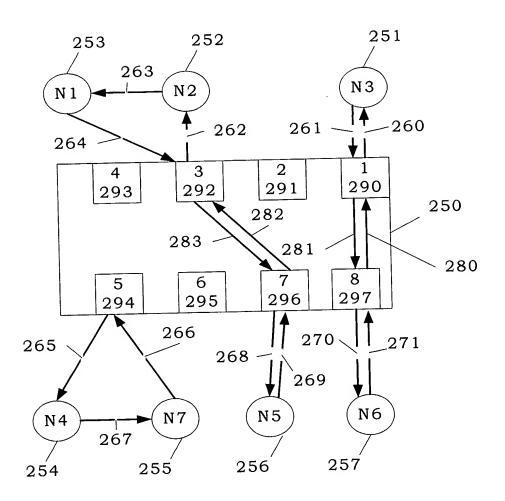


Fig. 6

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS

INVENTOR(S): U.S. Serial No.:

Warren Not yet assigned

7 of 52 Page: Exp Mail label EV337191006US

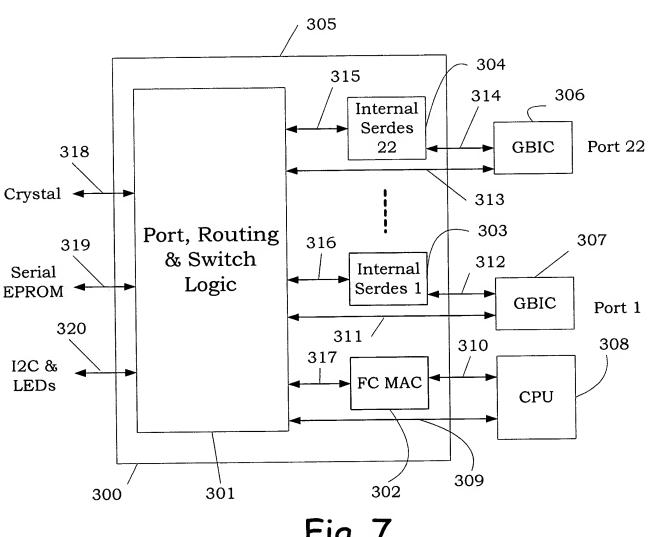


Fig. 7

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL

ARBITRATED LOOP SYSTEMS Warren INVENTOR(S): Not yet assigned U.S. Serial No.: 8 of 52

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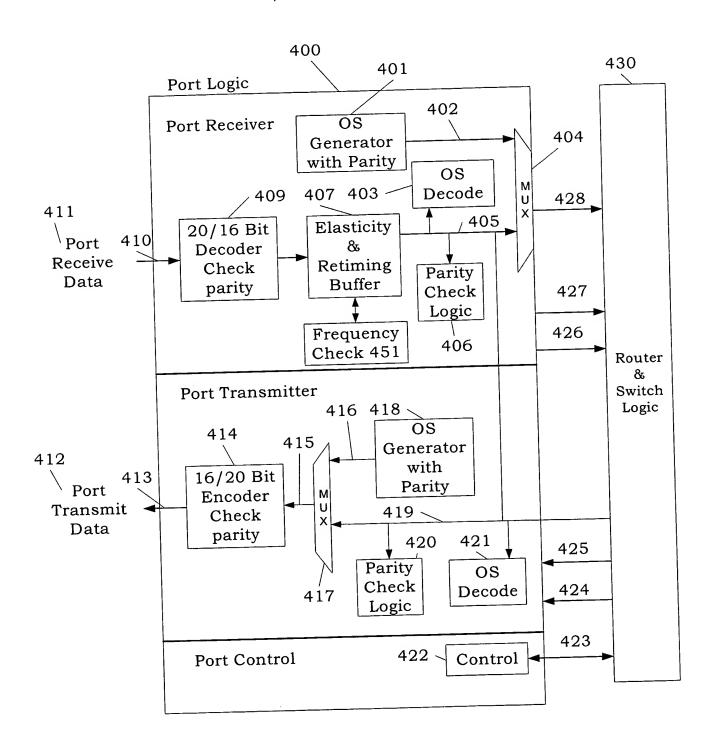


Fig. 8

TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS Warren INVENTOR(S): Not yet assigned U.S. Serial No.:

9 of 52

Page: Exp Mail label EV337191006US

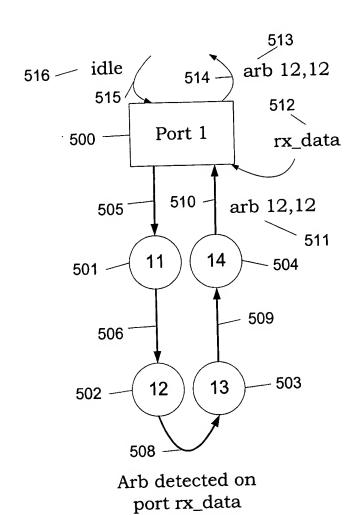
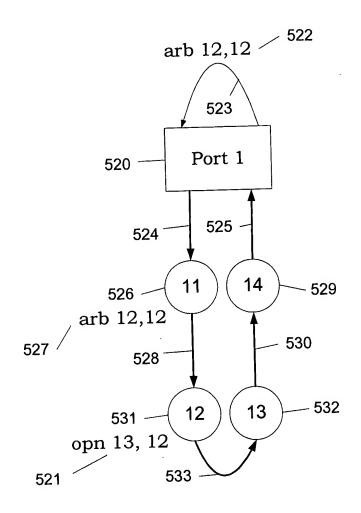


Fig 9a

TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren

U.S. Serial No.: Not yet assigned 10 of 52

Page: 10 of 52 Exp Mail label EV337191006US

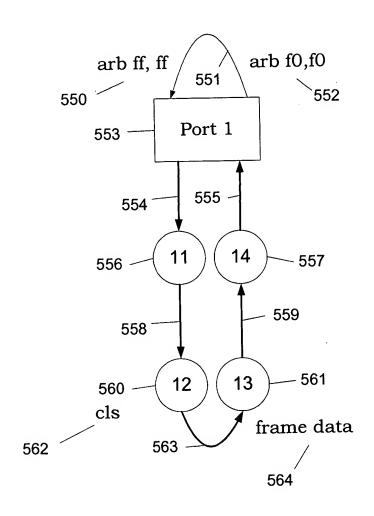


Connection established. Open sourced

Fig 9b

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS Warren INVENTOR(S): Not yet assigned U.S. Serial No.:

11 of 52 Page: Exp Mail label EV337191006US



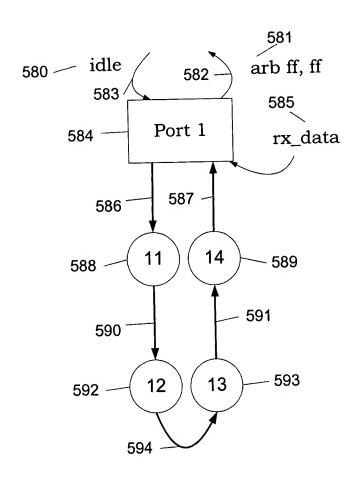
Arbf0 replaced with Arbff. Data Transfered. Close sourced.

Fig 9c

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL

ARBITRATED LOOP SYSTEMS
INVENTOR(S): Warren
U.S. Serial No.: Not yet assigned

Page: 12 of 52 Exp Mail label EV337191006US



Arbff detected on port rx\_data.
Disconnect. Source idles

Fig 9d

TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS Warren INVENTOR(S):

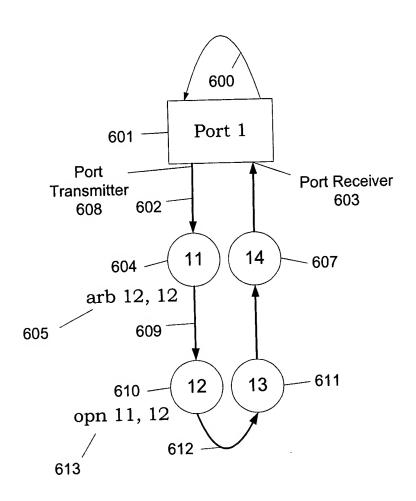
U.S. Serial No.:

Not yet assigned

Page:

13 of 52

Exp Mail label EV337191006US



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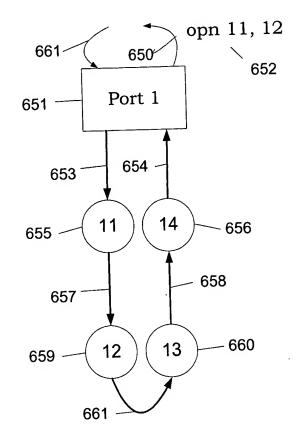
Fig 10a

TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren

U.S. Serial No.: Not y

Not yet assigned 14 of 52

Page: 14 01 32 Exp Mail label EV337191006US



Open detected at port receiver.

Port receiver holds open.

Provides ALPA to router and asserts opn\_connect\_req.

Fig 10b

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren U.S. Serial No.: Not yet assigned Page: 15 of 52

Page: 15 of 52 Exp Mail label EV337191006US

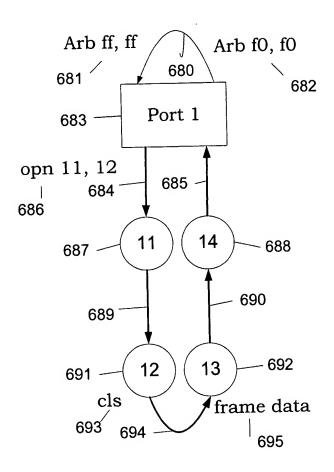


Fig 10c

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL

ARBITRATED LOOP SYSTEMS INVENTOR(S): U.S. Serial No.:

Warren Not yet assigned

Page:

16 of 52 Exp Mail label EV337191006US

Arbff detected on port rx\_data. Disconnect. Source idles.

713

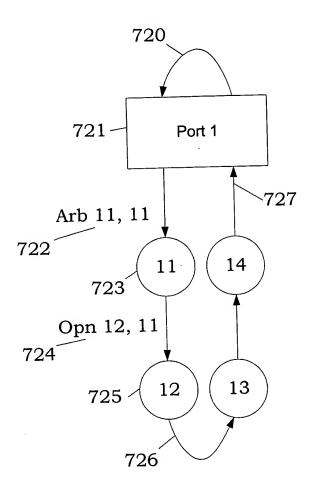
Fig 10d

TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS Warren

INVENTOR(S): U.S. Serial No.:

Page:

Not yet assigned 17 of 52 Exp Mail label EV337191006US



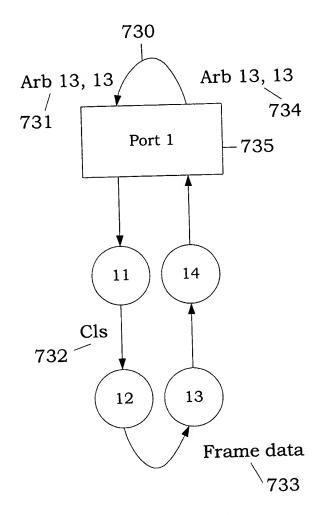
Arbs forwarded. Open Sourced.

Fig 11a

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren

U.S. Serial No.: Not yet assigned 18 of 52

Exp Mail label EV337191006US



Arb 13 forwarded. Data Transfered. Close sourced.

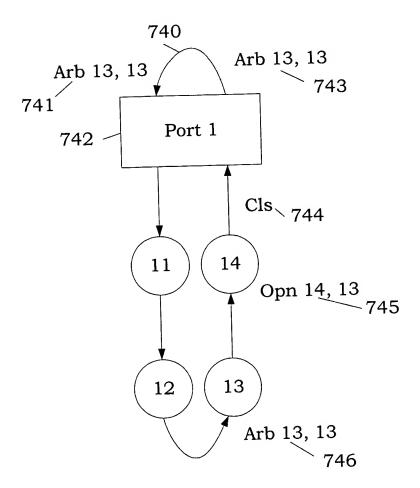
Fig 11b

TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS Warren INVENTOR(S):

U.S. Serial No.: Page:

Not yet assigned

19 of 52 Exp Mail label EV337191006US

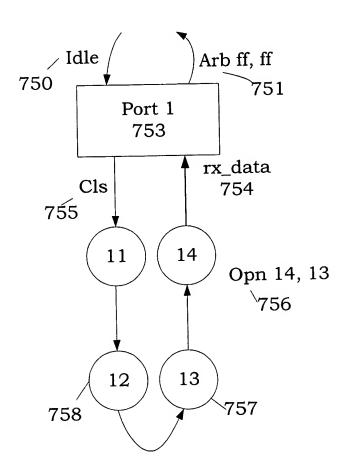


Close forwarded by node 12. Arb 13 received by node 13. Open sourced by node 13.

Fig 11c

TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren

U.S. Serial No.: Not yet assigned Page: 20 of 52 Exp Mail label EV337191006US



Close source by node 13.
Forwarded by node 12.
Arb ff Detected on port rx\_data.
Disconnect.
Source idles.

Fig 11d

TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren

U.S. Serial No.: Not yet assigned 21 of 52

Page: 21 of 52 Exp Mail label EV337191006US

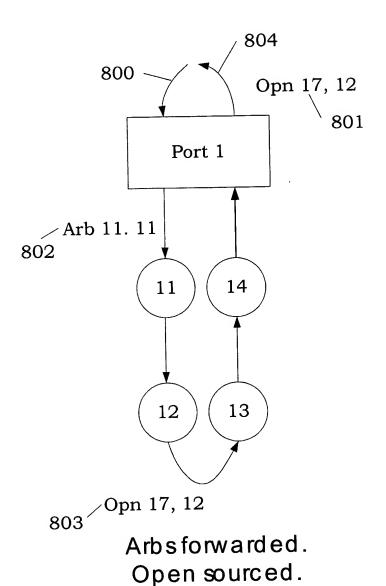
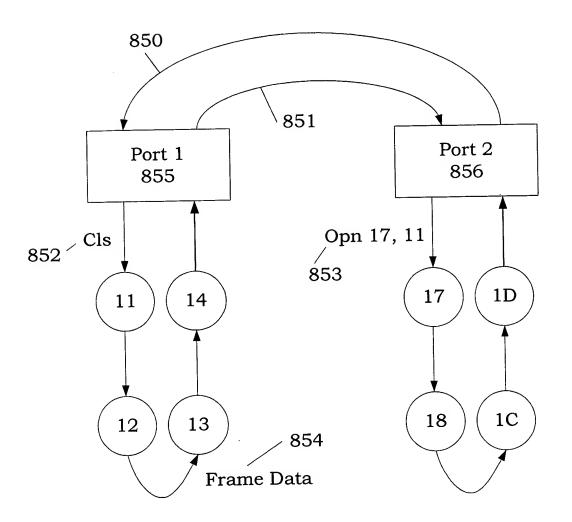


Fig 12a

TRUNKING IN FIBRE CHANNEL
ARBITRATED LOOP SYSTEMS
INVENTOR(S): Warren
U.S. Serial No.: Not yet assigned
Page: 22 of 52
Exp Mail label EV337191006US



Open forwarded to Port 2.

Data transferred.

Close sourced.

Open received from Port 1.

Data received.

Close forwarded.

Fig 12b

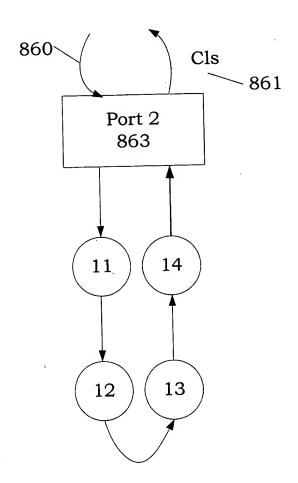
TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren

U.S. Serial No.:

Not yet assigned

Page:

23 of 52 Exp Mail label EV337191006US



Close detected at transmillter and receiver. Connection broken.

Fig 12c

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren U.S. Serial No.: Not yet assigned

Page: 24 of 52 Exp Mail label EV337191006US

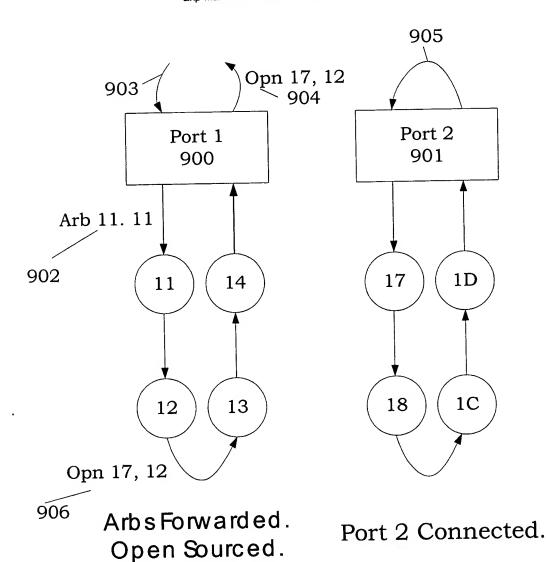
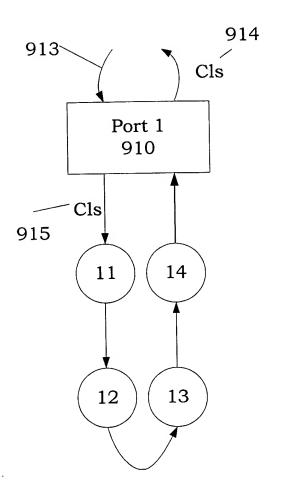


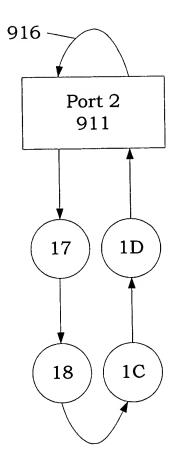
Fig 13a

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL

ARBITRATED LOOP SYSTEMS
INVENTOR(S): Warren

U.S. Serial No.: Not yet assigned Page: 25 of 52 Exp Mail label EV337191006US





Cls detected at port receiver from node 12.
Cls sourced from port transmitter.

Port 2 still connected.

Fig 13b

TRUNKING IN FIBRE CHANNEL
ARBITRATED LOOP SYSTEMS
INVENTOR(S): Warren
U.S. Serial No.: Not yet assigned

Page: 26 of 52 Exp Mail label EV337191006US I

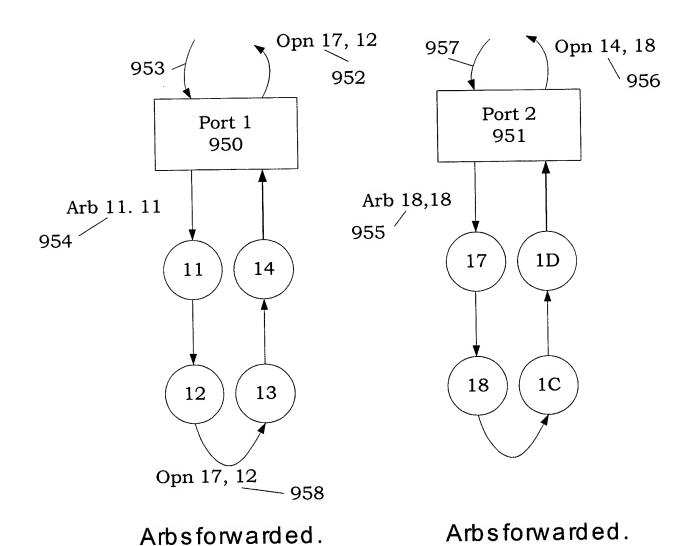


Fig 14a

Open sourced.

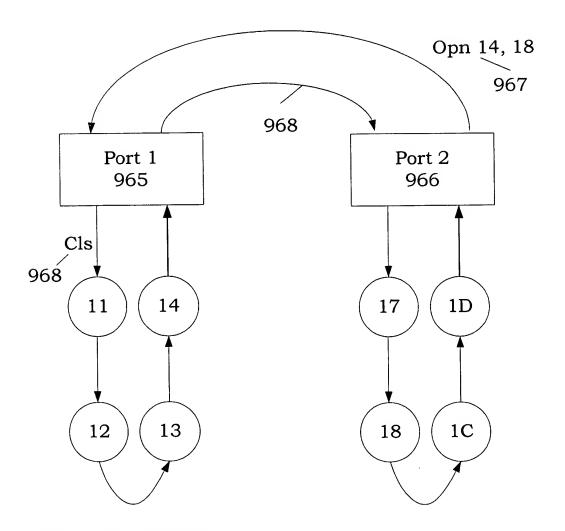
Open sourced.

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS

INVENTOR(S): U.S. Serial No.:

Warren Not yet assigned

Page: 27 of 52 Exp Mail label EV337191006US



Port 1 connected as destination port.
Cls sourced from Port 1 transmitter.

Port 2 connected as source Port. Open sourced from Port 2 receiver.

## Fig 14b

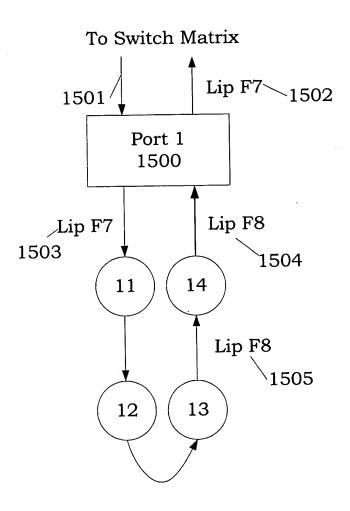
TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren

U.S. Serial No.:

Not yet assigned 28 of 52

Page: 28 of 52 Exp Mail label EV337191006US

## Router detects Lip RX'd signal. Router deasserts switched mode signal.



Lip F8 sourced by node 13. Lip F8 replaced by Lip F7 at port receiver. Lip F7 sourced at port transmitter.

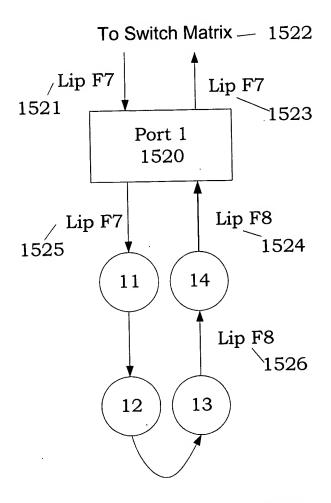
Fig 15a

TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren

U.S. Serial No.: Not yet assigned 29 of 52

Exp Mail label EV337191006US

Router detects deassertion of port active. Router takes port out of operational loop.



Lip F7 received at port transmitter. Port deasserts port active signal.

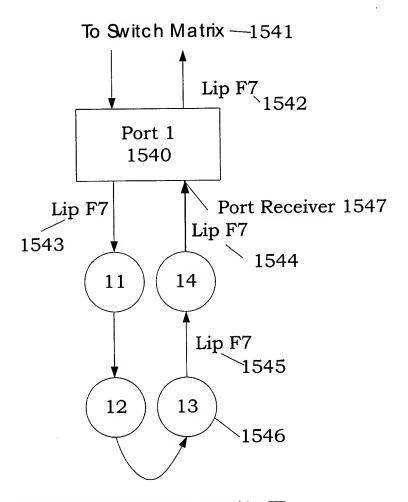
Fig 15b

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren

U.S. Serial No.: Page:

Not yet assigned 30 of 52 Exp Mail label EV337191006US

Router detects Lip RX'd signal since port active is now asserted. Router puts port back into the operaional loop.



Node 13 "heals", source Lip F7. Lip F7 received at port receiver. Port asserts Port\_Active.

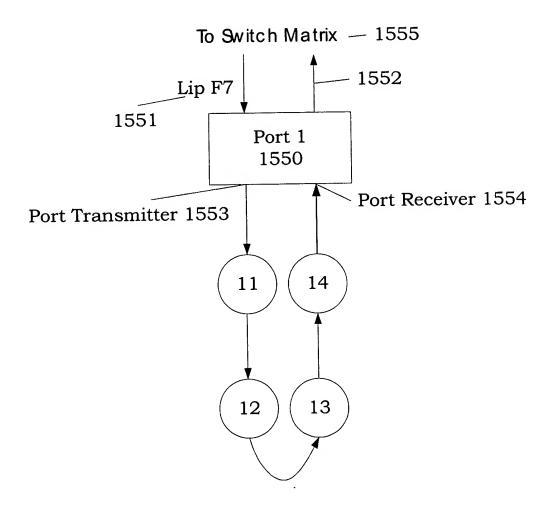
Fig 15c

TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren

U.S. Serial No.: Not yet assigned Page: 31 of 52

Exp Mail label EV337191006US

## Router continues with loop initialization



Port detects Lip F7 at port transmitter.
Port stops sourcing Lip F7 at port receiver.
Port stops sourcing Lip F7 at port transmitter.

Fig 15d

TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren

U.S. Serial No.: Not yet assigned Page: 32 of 52

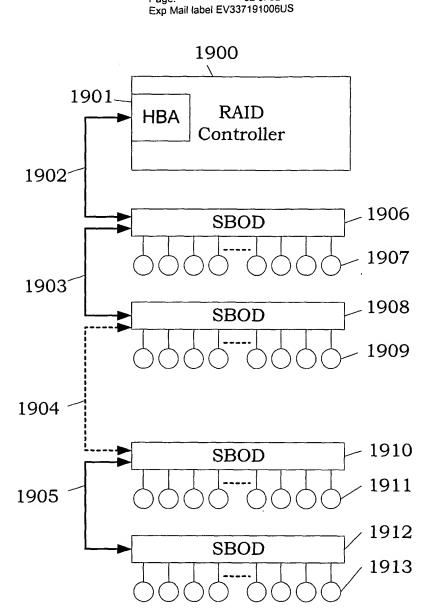


Fig. 16a

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren U.S. Serial No.: Not yet assigned Page: 33 of 52

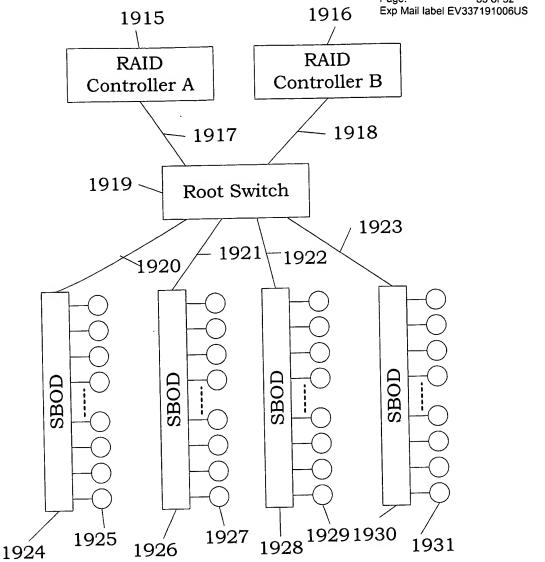


Fig. 16b

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren U.S. Serial No.: Not yet assigned Page: 34 of 52

Page: 34 of 52 Exp Mail label EV337191006US

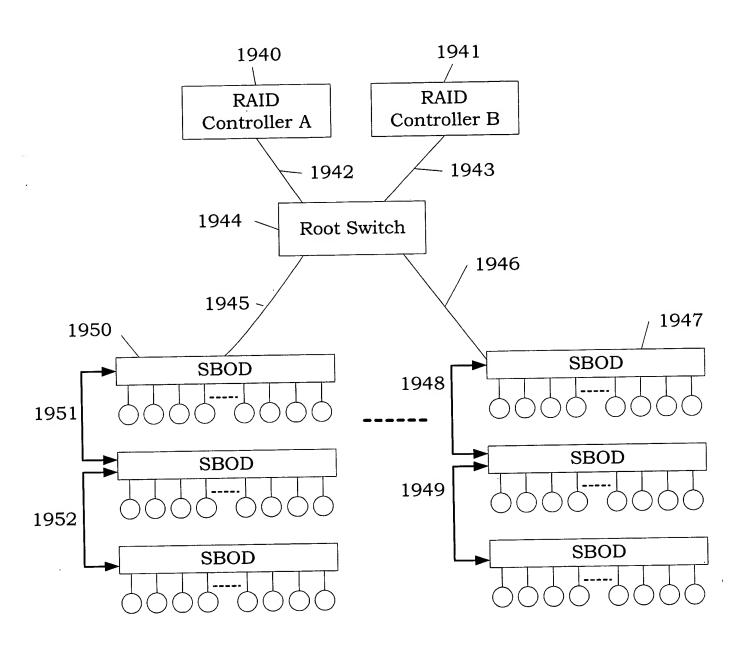
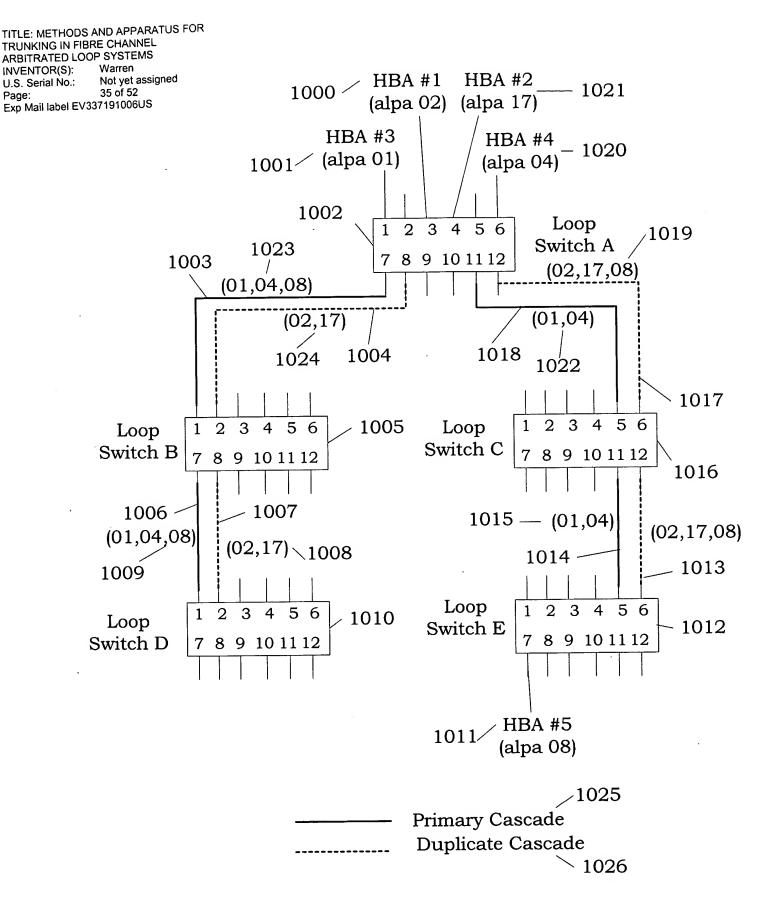


Fig. 16c



Page:

Fig. 17

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS Warren INVENTOR(S):

U.S. Serial No.:

Not yet assigned

36 of 52 Exp Mail label EV337191006US

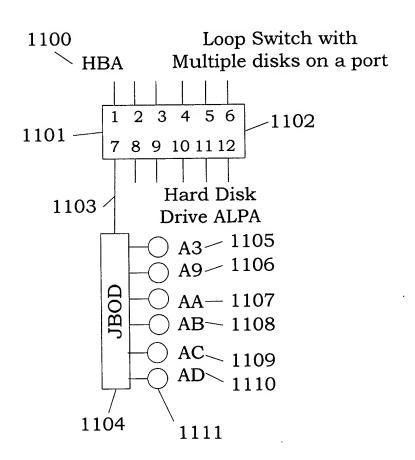
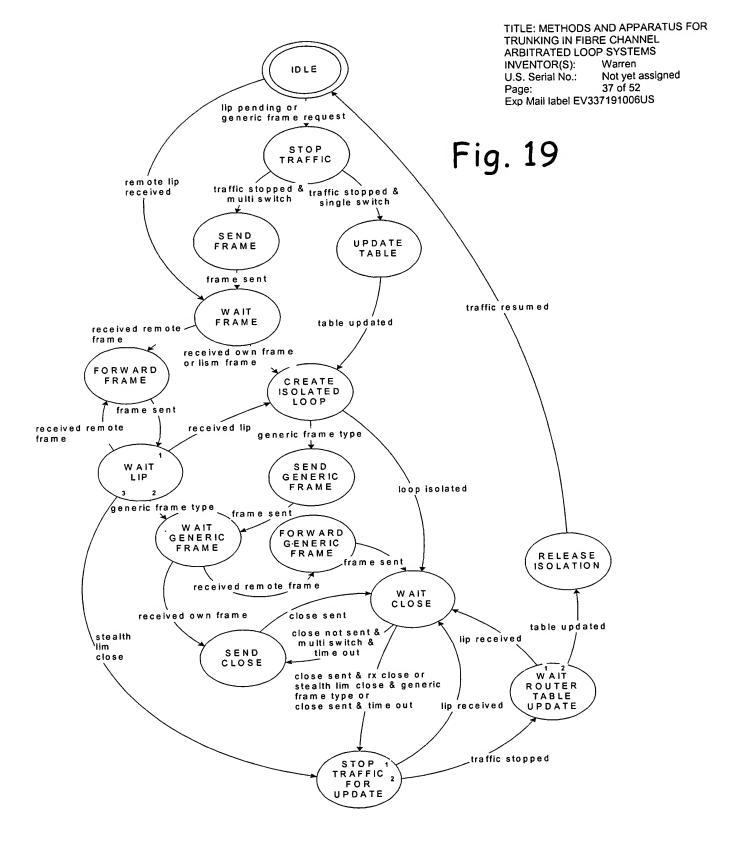


Fig. 18



Receive Receive LIP LIP HBA #2 HBA #1 1200 1209 Port Port 1210 1211 1207 1201 | 1203 Router Logic 1208 1206 Loop Switch Port Port 1202 1213 1212 Disk Disk 1204 #2 1205 -#1 Forward Forward LIP LIP

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren U.S. Serial No.: Not yet assigned Page: 38 of 52 Exp Mail label EV337191006US

Fig. 20

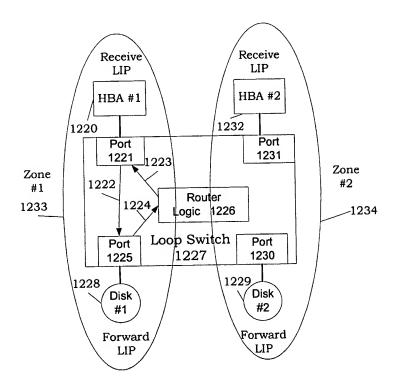


Fig. 21

TITLE: METHODS AND APPARATUS FOR

TRUNKING IN FIBRE CHANNEL
ARBITRATED LOOP SYSTEMS
INVENTOR(S): Warren
U.S. Serial No.: Not yet assigned

U.S. Serial No.: Not yet assi Page: 39 of 52 Exp Mail label EV337191006US

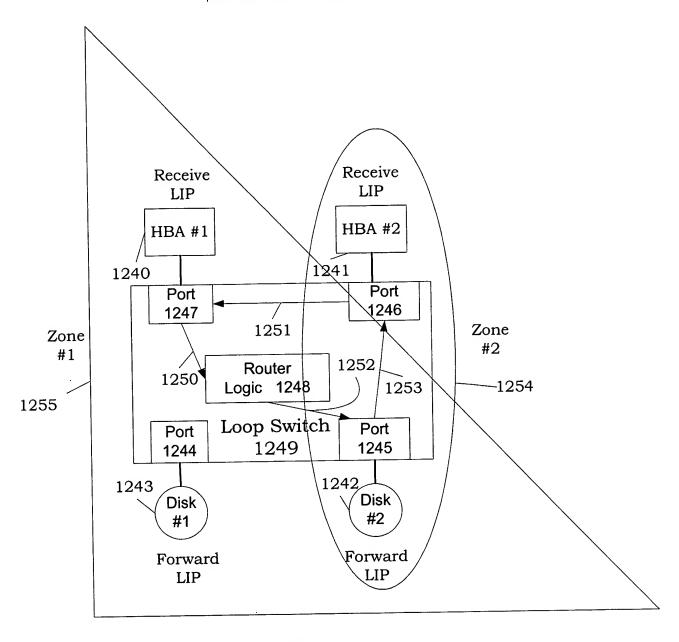


Fig. 22

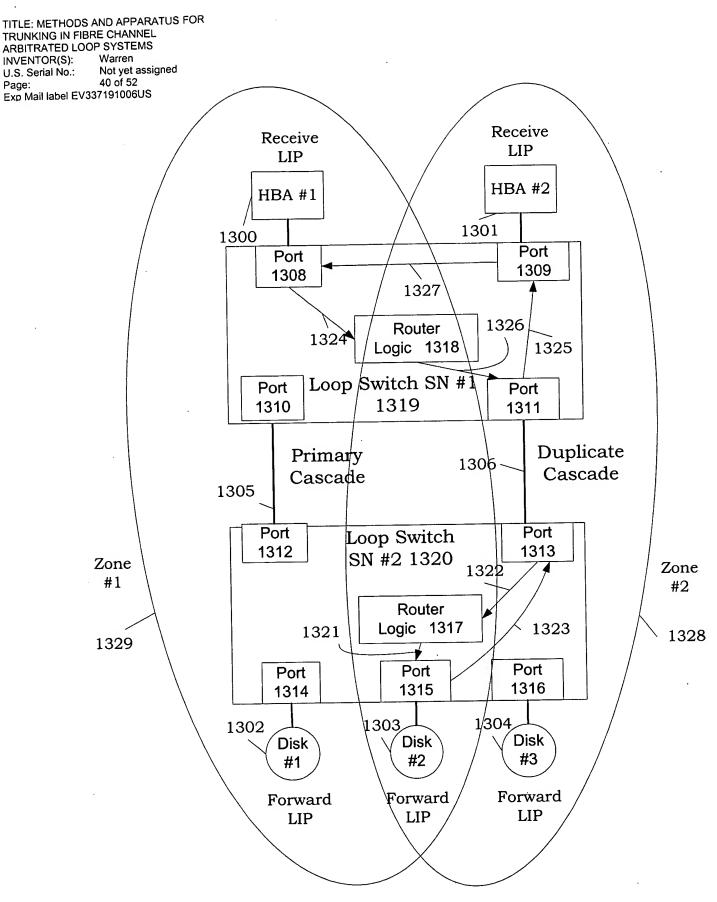


Fig. 23

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren Not yet assigned U.S. Serial No.: 41 of 52 Page: Exp Mail label EV337191006US Forward Receive LIP LIP Disk #3 **HBA #1** 1401 1400 Port Port 1409 1408 1427 1426 Router Logic 1418 1425 Loop Switch SN #1 Port Port 1419 1410 1411 **Duplicate Primary** Cascade Cascade 1405 1406 Port Port Loop Switch 1413 1412 SN #2 1420 Zone Zone 1422 #1 #2 Router 1421 Logic 1417 1428 1423 1429 Port Port Port 1415 1416 1414 1402 1403 Disk Disk #2 #1 HBA #2 Forward Forward Receive 1404 LIP LIP LIP

Fig. 24

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren Not yet assigned U.S. Serial No.: 42 of 52 Page: Exp Mail label EV337191006US Forward Receive LIP LIP Disk #3 **HBA #1** 1501 1500 Port Port 1509 1508 1527 Router 1526 Logic 1/518 1525 Loop Switch \$N #1 Port Port 1519 1510 1511 **Duplicate Primary** Cascade Cascade 1505 1506 Port Port Loop Switch 1513 1512 SN #2 1520 Zone 1522 #1 Zone Router #2 1521 1517 Logic 1523 1528 1529 Port Port Port 1516 1514 1515 1503 1502 Disk Disk #2 #1 **HBA #2** Forward **Forward** Receive 1504 LIP LIP LIP

Fig. 25

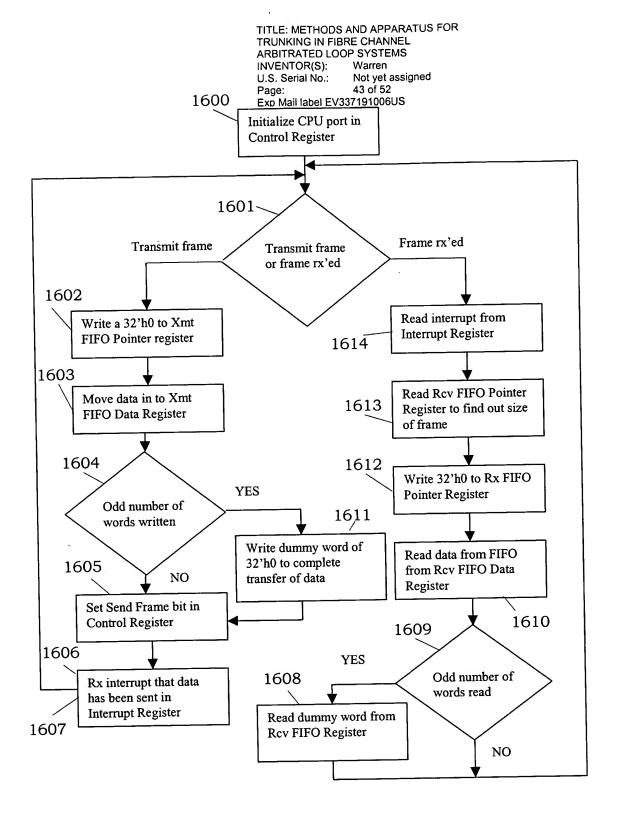


Fig. 26

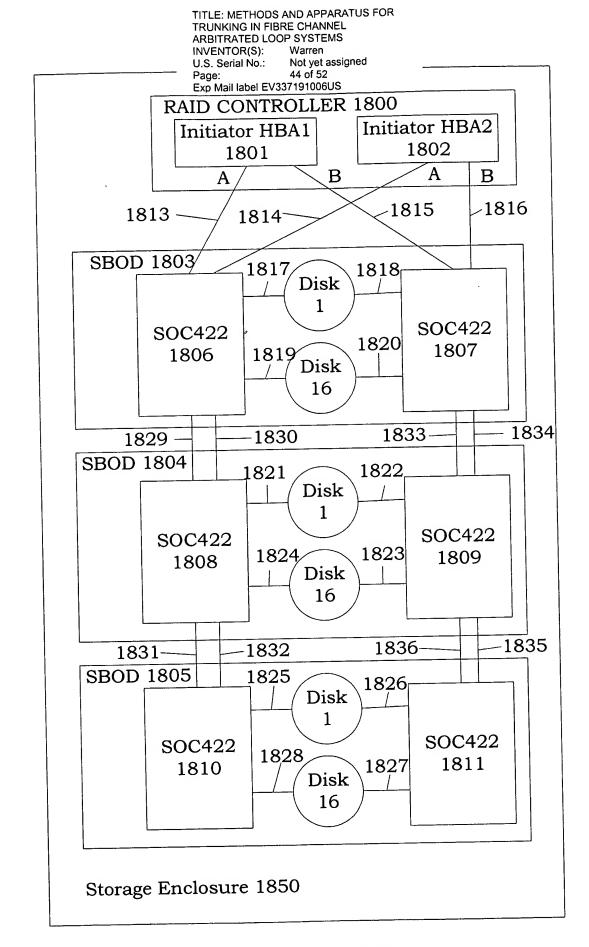


Fig. 27

TITLE: METHODS AND APPARATUS FOR

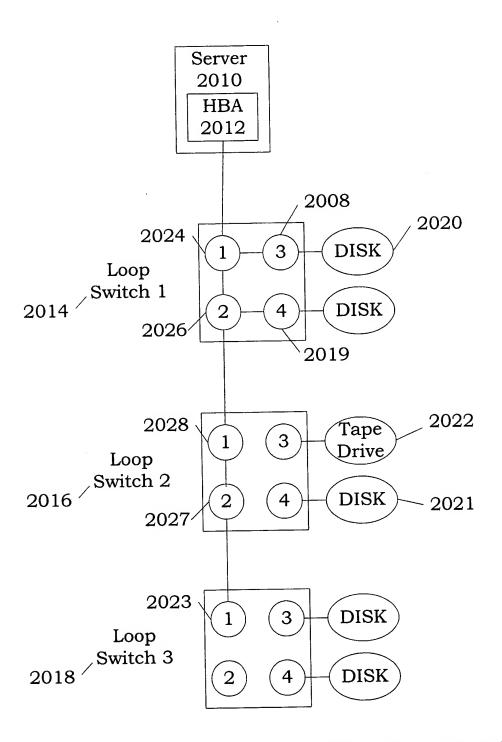
TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS Warren INVENTOR(S):

U.S. Serial No.:

Not yet assigned

Page:

45 of 52 Exp Mail label EV337191006US

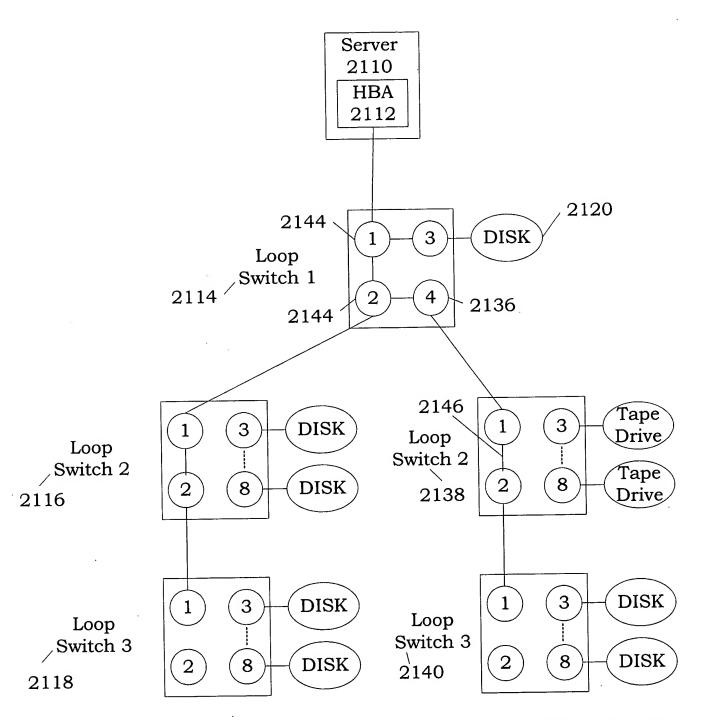


DISK = Fibre Channel Hard Disk Drive

Fig. 28

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren U.S. Serial No.: Not yet assigned

Page: 46 of 52 Exp Mail label EV337191006US



DISK = Fibre Channel Hard Disk Drive

Fig. 29

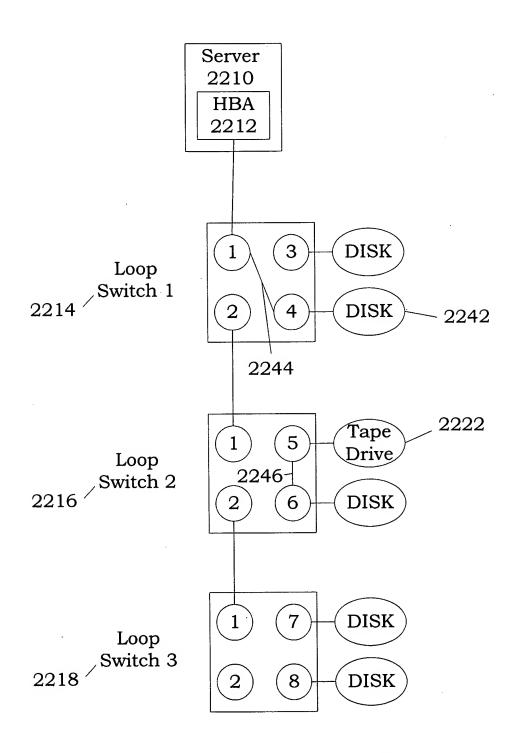
TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS

Warren

INVENTOR(S): U.S. Serial No.:

Not yet assigned

Page: 47 of 52 Exp Mail label EV337191006US



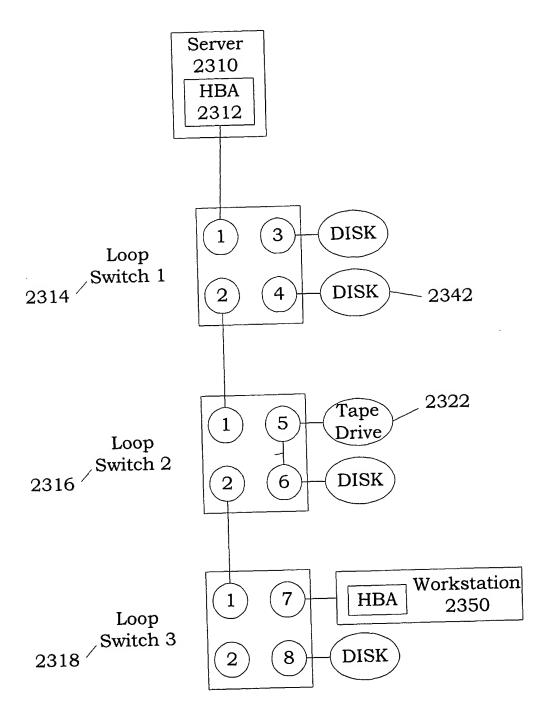
DISK = Fibre Channel Hard Disk Drive

Fig. 30

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren

U.S. Serial No.: Not yet assigned 48 of 52

Page: 48 of 52 Exp Mail label EV337191006US



DISK = Fibre Channel Hard Disk Drive

Fig. 31

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S):

U.S. Serial No.:

Warren Not yet assigned

Page:

49 of 52 Exp Mail label EV337191006US

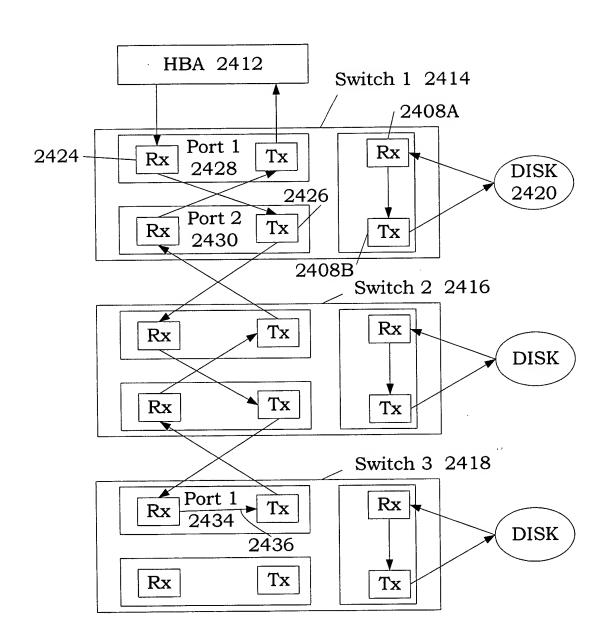


Fig. 32

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL

ARBITRATED LOOP SYSTEMS INVENTOR(S): U.S. Serial No.:

Warren

Page:

Not yet assigned 50 of 52 Exp Mail label EV337191006US

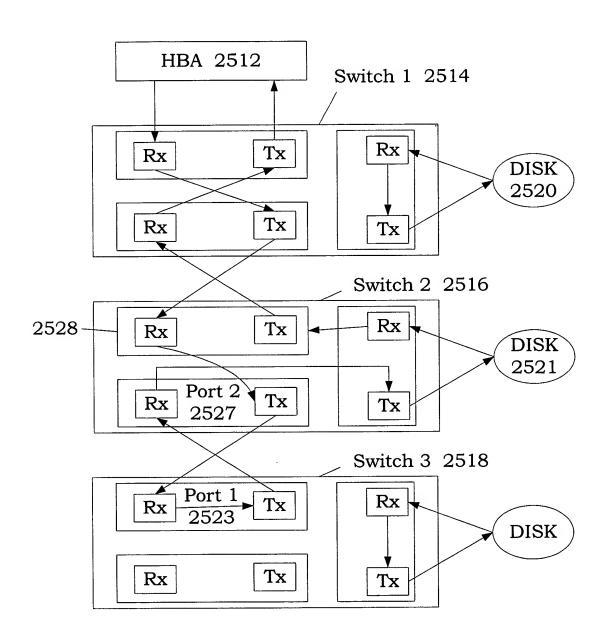


Fig. 33

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS Warren

INVENTOR(S): U.S. Serial No.:

Not yet assigned 51 of 52

Page:

Exp Mail label EV337191006US

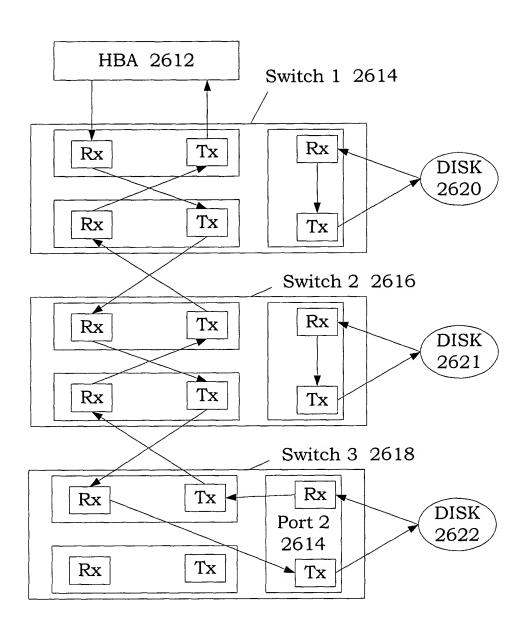


Fig. 34

TITLE: METHODS AND APPARATUS FOR TRUNKING IN FIBRE CHANNEL ARBITRATED LOOP SYSTEMS INVENTOR(S): Warren

U.S. Serial No.: Not yet assigned

52 of 52 Page:

Exp Mail label EV337191006US

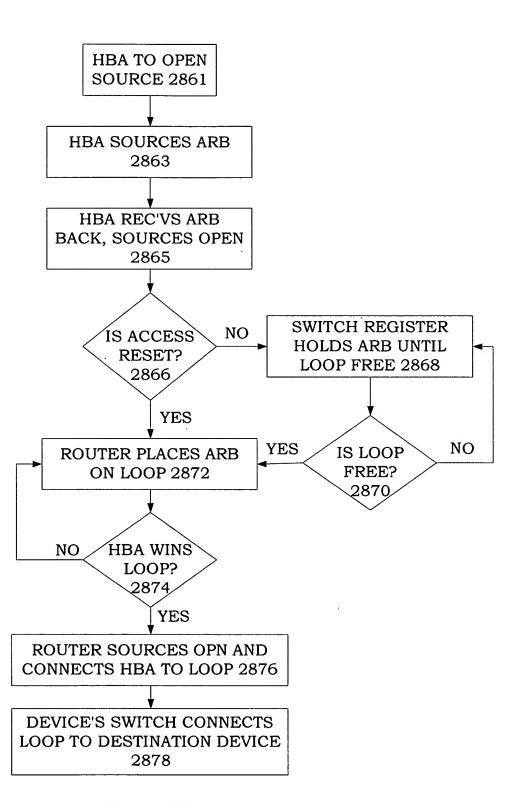


Fig. 35